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INFLATABLE LIFE-SAVING RAFT

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4 Sheets-Sheet 1

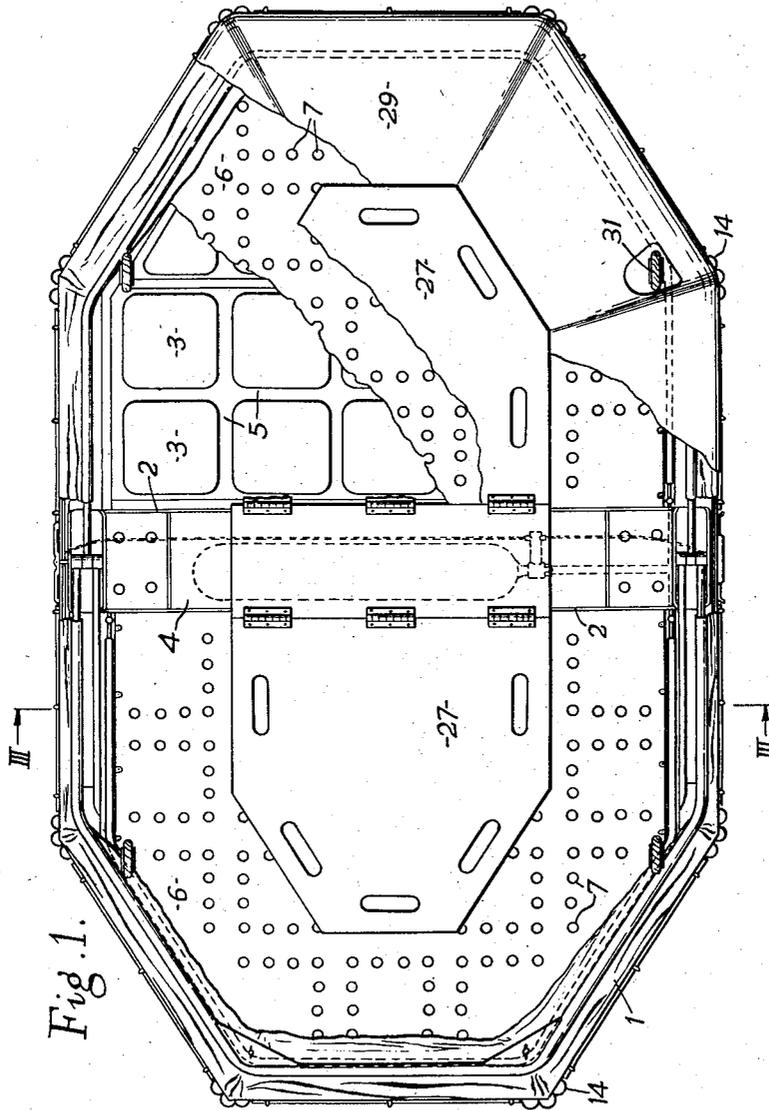


Fig. 1.

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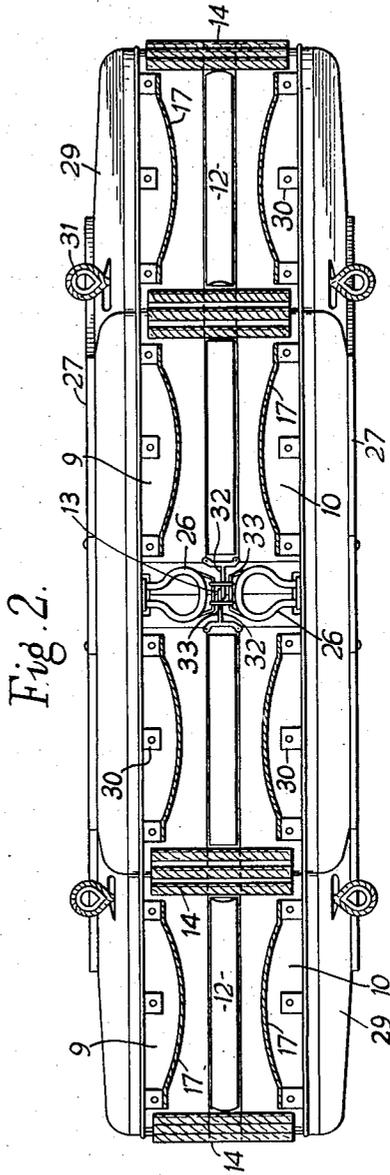
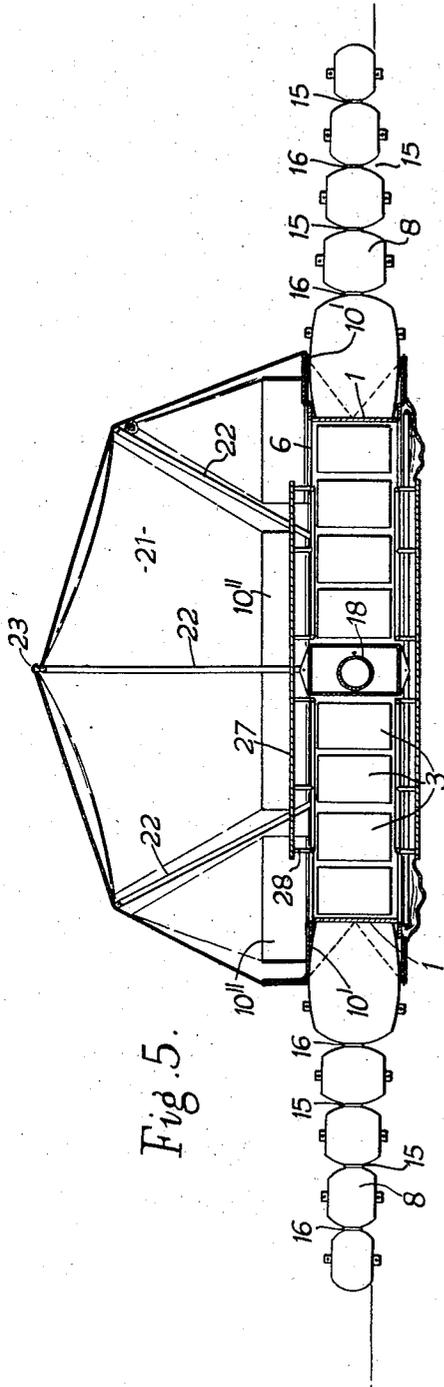
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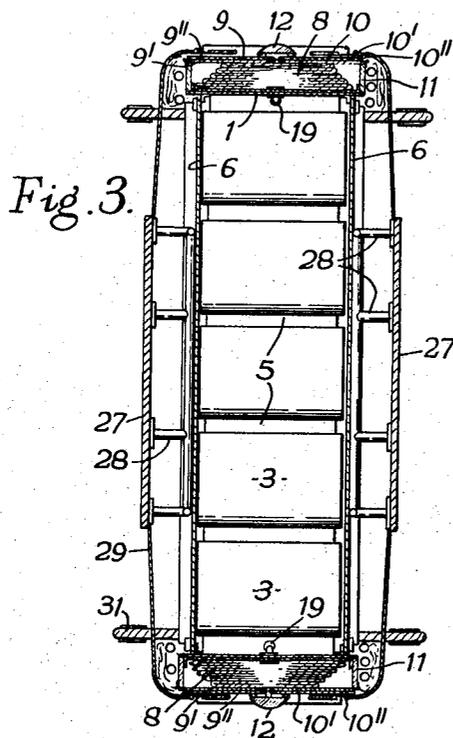
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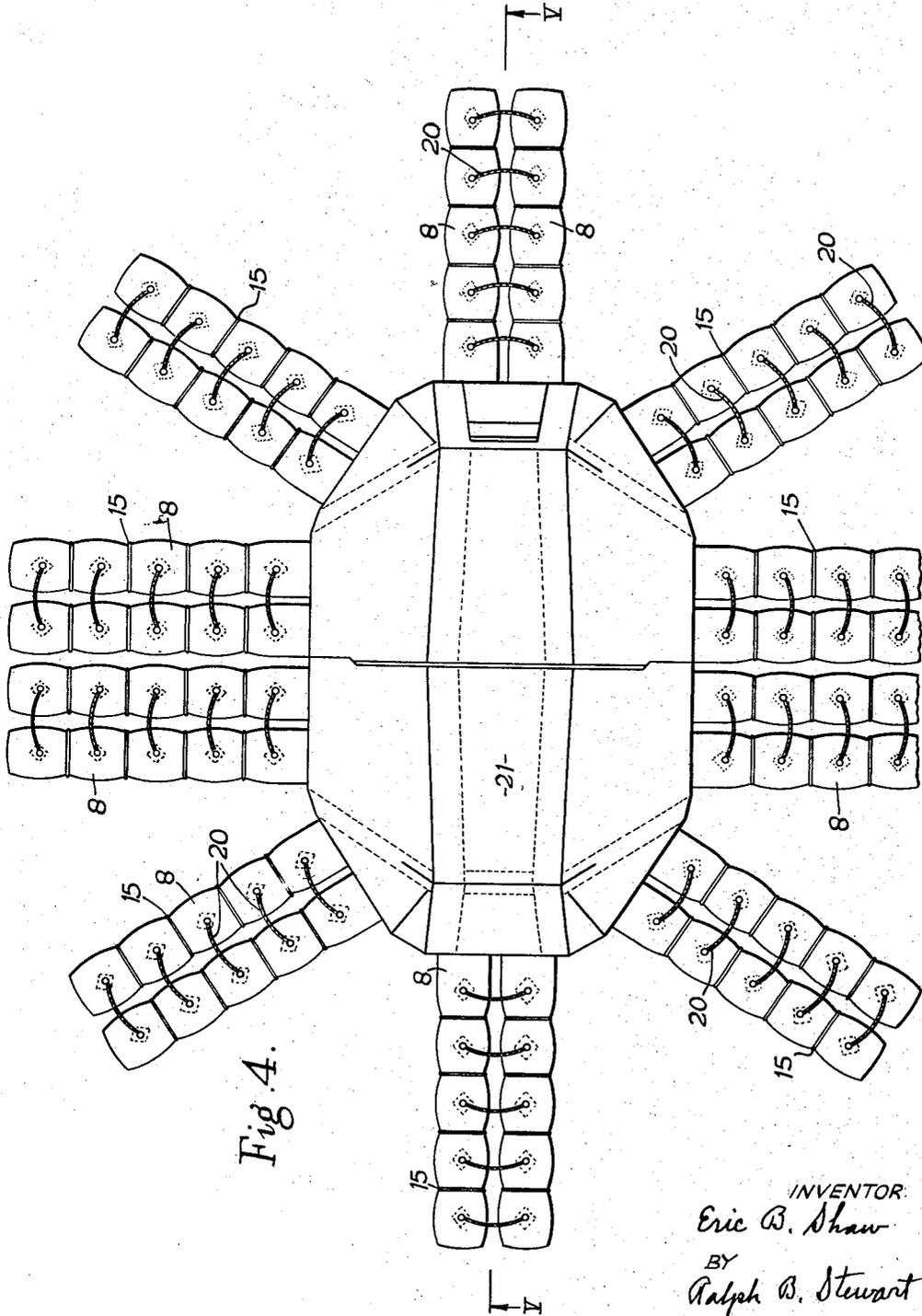


Fig. 4.

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INFLATABLE LIFE-SAVING RAFT

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Application July 1, 1955, Serial No. 519,575

4 Claims. (Cl. 9—11)

The present invention relates to an improved form of buoyant structure for use on water and of the kind embodying inflatable envelopes of flexible water-proof material capable of being stowed in a compacted form when in the normal uninflated condition of non-use, in compartments of relatively small size, forming part of the structure.

It is one object of the invention to provide a buoyant structure suitable for use as a buoy or raft offering a high degree of buoyancy and stability as well as large carrying capacity when afloat, the buoy or raft being nevertheless very compact when stowed.

It is a further object of the invention to provide a buoyant structure suitable for use as an attachment for a boat, the floats of a flying boat, and like bodies intended to be used on the water, and also the fuselages or other appropriate parts of aircraft which though not normally intended to be water-borne are required to fly over water and are thus liable to land on water.

In accordance with the invention a buoyant structure is provided comprising a number of inflatable tubes of flexible material connected with a rigid or substantially rigid buoyant portion, the arrangement being such that the tubes when uninflated are folded or rolled and stowed close against the, or an, outer surface of the rigid buoyant portion and when inflated are elongated and extend away from the rigid buoyant portion in spaced relationship to one another and with the axes of the tubes in a general plane corresponding to or approaching that of the surface of the water when the buoyant structure is afloat so that the free ends of the tubes are capable of some free up and down movement relative to the rigid or substantially rigid buoyant portion.

In the case of a buoy or raft the inflatable flexible tubes are distributed in spaced relationship around the peripheral wall of a central rigid buoyant portion having similar upper and lower surfaces usually of a symmetrical shape in plan, e.g. an elongated octagon, and of a construction which is symmetrical about a median plane between said upper and lower surfaces. Such a buoy or raft may be launched by merely throwing it into the water without regard for which of its sides is uppermost when afloat and when the flexible tubes are thereafter inflated they take positions in which they extend in general radial directions in predetermined distribution from the central buoyant portion in which they lie on the surface of the water.

The invention is illustrated by way of example in the accompanying drawings in which Figs. 1-5 show a life-raft or buoy constructed in accordance with the invention, Fig. 1 being a view in plan showing the life-raft in the folded condition suitable for stowage on board a ship, Fig. 2 is a view in side elevation of Fig. 1.

Fig. 3 is an end sectional elevation on the line III—III of Fig. 1.

Fig. 4 is a view in plan showing the condition of the life-raft of Fig. 1 with the tubes inflated, and

Fig. 5 is a view in sectional side elevation on the line V—V of Fig. 4.

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Referring to the drawings Figs. 1 to 5, the central rigid buoyant main body portion of the life-raft comprises an outer frame 1 of wood, sheet metal or other water resistant sheet material, having the shape in plan, in the case illustrated, of an elongated octagon.

The frame 1 is fitted with intersecting cross braces 2 which provide compartments or lockers, some for the reception of buoyant elements, formed for example of canisters 3 of sheet metal, and others for stowage of food and equipment such as radio apparatus, the last mentioned lockers being provided with water-tight lids or covers 4 at both the top and bottom sides thereof.

The canisters or other buoyant elements 3 are mounted so as to provide spaces 5 between them extending from one side of the frame to the other.

The frame 1 is decked on both sides with similar main decks 6 of sheet material such as water-resistant plywood, these decks 6 being provided with a multiplicity of holes 7 and further or secondary central decks 27 of somewhat smaller area than the main decks 6, are fixedly mounted on posts 28 and spaced by a short distance from the main decks 6.

To the external surface of the frame 1 are attached with an air-tight connection, one end of each of a number of flexible tubes 8 (Figs. 4 and 5), formed of rubberised canvas or any other known form of air-tight and flexible material, the said tubes 8 being closed at their outer ends and being distributed in predetermined spaced relationship around the frame 1.

The tubes 8 when uninflated are folded or rolled flat to take a collapsed position close against the external surface of the frame 1 as shown at 8 in Fig. 3.

The tubes are retained in this flat condition, by means of pairs of flaps 9 and 10 connected with spacing pieces 11 hinged to the top and bottom edges of the outer frame 1, the said flaps 9 and 10 meeting on the centre line between said edges and being retained in the tube-enclosing position by means of a girdle 12 encircling the frame 1 and the ends of which are retained by a quick-release device 13.

The quick-release mechanism 13 for the girdle 12 may consist of a pair of shallow hooks 32 affixed one to each end of the girdle, the said hooks in the retaining position being engaged from opposite sides with a fixed vertical rod or tube.

On the shank of each hook 32 is welded a cross piece 33 adapted to occupy, in the retaining condition, a vertical position in the path of either one of two handles 26 mounted on horizontal pivots near the top and bottom edges of the frame. An outward pull on either of the handles 26 prises the hooks 32 from engagement with the fixed vertical rod or tube to release the girdle 12. The girdle 12 may be connected with fenders 14 adapted to embrace the corners of the frame 1.

The tubes 8 by virtue of their flexibility and elongated form when inflated are capable of flexure permitting some degree of freedom of up and down movement to the outer free ends thereof relative to the central rigid portion of the life raft. In the case illustrated the tubes 8 are formed with transverse constrictions 15 at spaced intervals along their length, such constrictions resulting in tubes 8 which when inflated comprise in effect a number of articulated sections capable of relative movement to permit the tubes to accommodate themselves throughout the greater part of their length to movement of the water when the buoy is water-borne.

The constrictions 15 may be formed by tying or stitching across the tubes 8. In the preferred arrangement frames 16 of light metal are applied about the tubes (Fig. 5).

Life lines 17 are provided on the outside of each of the tube-retaining flaps 9, 10,

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For inflating the tubes 8 a CO₂ bottle 18 (Fig. 5) is mounted in one of the lockers in the central body portion, the outlet from said bottle being operable in any convenient manner by operation of the quick-release device 13 for releasing the girdle 12, and the CO₂ gas is released into an expansion chamber (not shown) whence it is led by way of a number of pipes 19 (Fig. 3) to the tubes 8. In or on the expansion chamber there is provided a non-return valve for each pipe 19 as well as a removable plug to permit deflation of the tubes 8 by way of the pipes 19. A hand pump (not shown) is also provided in a locker of the central rigid portion to permit inflation of the tubes 8 in the event of failure or exhaustion of the CO₂ bottle.

In the preferred arrangement as shown the tubes 8 are arranged in parallel pairs, one pair at each of the short sides of the octagon and two pairs at each of the two longer sides thereof.

The tubes 8 of each pair are spaced from each other by a short distance and are strapped together by means of short lengths of rope or the like 20.

On each of the upper and lower surfaces of the central portion is mounted a hood 21 of canvas or the like carried by hoops 22 hinged to the frame 1, the said hood being preferably in two parts each adapted normally to lie folded about one half of the edge of the main deck 6 and below the level of the secondary deck 27, the two parts of the hood being arranged to be joined to one another on the vertical centre line 23 (Fig. 5) when erected. Foldable flaps are provided in the end wall of one of the two parts of each hood to give entry.

The raft or buoy in the stowed condition may be provided with protective covers 29 of canvas extending from the underside of the edges of the secondary decks 27 over the edges of the frame 1 of the central rigid part of the buoy or raft and secured by tabs 30 to the outside surfaces of the tube-enclosing flaps 9 and 10.

With this arrangement the secondary decks 27 present external surfaces upon which the raft or buoy will rest when stowed so that risk of abrasion of the canvas and other parts whilst the raft or buoy is not in use is eliminated or much reduced.

In operation the life-buoy or raft is merely thrown into the water and it will float with either side uppermost according to chance.

A person approaching the buoy or raft from the water takes hold of a life line 17 and works his way to the long side of the raft or buoy where the quick-release handles 26 are located. By pulling on either handle 26, the girdle 12 or other flap-retaining means is released and discarded and the flaps 9 and 10 retaining the folded tubes 8 are thus freed to open.

As the flaps 9 and 10 become free to open, the tabs 30 of the canvas cover 29 may be disconnected from the flaps 9 and 10 and the canvas cover 29 may now be removed from over the deck 6.

Operation of the handle 26 also releases CO₂ from the bottle 18 so that almost simultaneously with the release of the flaps 9 and 10 the tubes 8 commence to inflate. As inflation proceeds the tubes move into the position shown in Fig. 4 in which they extend radially outwards on all sides of the rigid central portion and rest on the water. The flaps 9 and 10 take positions above and below the ends of the tubes 8 adjacent the rigid central portion.

The articulated tubes 8 roped together in pairs provide a buoy or raft having a high degree of buoyancy and stability and the pairs of tubes 8 roped together are mutually bracing so that uncontrolled movement in the plane of the surface of the water is restrained.

A person or persons on the rigid central portion of the improved buoy or raft may now raise the hood if desired and has ready access to the contents of the lockers after raising of the hinged portion of the secondary deck 27, whether the hood is raised or not.

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In some cases the lower hood may also be unfolded beneath the water by manipulation of suitable ropes provided for the purpose, thereby providing a further stabilising means for the raft or buoy.

The tube-retaining flaps 9 and 10 may with advantage be formed of two pieces of wood or the like 9' and 9'' and 10' and 10'', Figs. 3 and 5, hinged together at their free edges and lying face to face in the tube-retaining position shown in Fig. 3 and the bottom edges of the pieces of canvas forming the hood 21 connected with the outermost one 9' or 10', of the two pieces so that when the hood is raised the piece 9'' or 10'' is drawn into a vertical position in which it may serve as a back for a seat formed by the other piece 9' or 10'. At the same time a hood of greater floor area than that of the rigid central part of the raft or buoy is achieved.

Water washing on to the central rigid portion flows away freely through the perforated main decking 6 and the spaces between the buoyant elements 3.

With a rigid centre portion about eight feet long, five feet wide and eighteen inches in depth, inflatable tubes about six feet in length and a hood having a floor area of about ten feet by six feet six inches, about twenty persons can be accommodated within the erected hood on the rigid central portion and from sixty to eighty further persons supported in the water by hanging on to the tubes 8 and other parts of the raft or buoy.

Lifting eyes 31 are provided to enable the raft to be lifted other than by hand.

I claim:

1. A life-raft comprising a central rigid and buoyant main body portion having substantial symmetry about a transverse median plane between upper and lower main surfaces thereof, a plurality of flexible and inflatable tubes of water-proof material connected each at one end only to said body portion, in spaced relationship around the peripheral wall of said central rigid and buoyant main body portion with the connected ends of said flexible and inflatable tubes embracing the said transverse median plane, said flexible inflatable tubes in the stowed condition of the life-raft lying collapsed and folded flat in close proximity with the said peripheral wall and in the condition of use of the life-raft being elongated and extending radially from the said central rigid and buoyant main portion, retaining means retaining the said flexible and inflatable tubes in the position of close proximity with the said peripheral wall when in the collapsed and folded condition of the tubes, self-contained inflating means mounted in said main rigid and buoyant portion for inflating the flexible inflatable tubes and a plurality of transverse constriction means on said tubes and spaced from one another longitudinally thereof and defining lines of high flexibility extending generally parallel to the said median plane in the inflated and extended condition of the tubes.

2. A life-raft comprising a central rigid and buoyant main body portion having substantial symmetry about a transverse median plane between upper and lower main surfaces thereof, a plurality of flexible and inflatable tubes of water-proof material connected each at one end only to said body portion, in spaced relationship around the peripheral wall of said central rigid and buoyant main body portion with the connected ends of said flexible and inflatable tubes embracing the said transverse median plane, said flexible inflatable tubes in the stowed condition of the life-raft lying collapsed and folded flat in close proximity with the said peripheral wall and in the condition of use of the life-raft being elongated and extending radially from the said central rigid and buoyant main portion, retaining means retaining the said flexible and inflatable tubes in the position of close proximity with the said peripheral wall when in the collapsed and folded condition of the tubes, and two collapsible hoods of flexible material mounted one on each of the said upper and

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lower main surfaces of the central rigid and buoyant main body portion.

3. A life-raft comprising a central rigid and buoyant main body portion having substantial symmetry about a transverse median plane between upper and lower main surfaces thereof, a plurality of flexible and inflatable tubes of water-proof material connected each at one end only to said body portion, in spaced relationship around the peripheral wall of said central rigid and buoyant main body portion with the connected ends of said flexible and inflatable tubes embracing the said transverse median plane, compartments in the peripheral wall of the central rigid main body portion containing the said flexible tubes in the collapsed uninflated condition thereof, closure elements for said compartments, two substantially similar main decks at the upper and lower main surfaces of the said central rigid and buoyant main body portion, two substantially similar secondary decks supported outside and generally parallel to and spaced from said main decks, two collapsible hoods of flexible material occupying collapsed positions on the main decks and around and below the levels of the secondary decks, and detachable flexible covers secured one to each of the said secondary decks and extending outwards over outer portions of the main decks, the collapsed hoods thereon and the peripheral edges of the main decks, and securing means securing the edges of the said flexible covers to the said closure elements in the compartment closing positions of said elements.

4. A life-raft comprising a central rigid and buoyant main body portion having substantial symmetry about a transverse median plane between upper and lower main surfaces thereof, a plurality of flexible and inflatable pairs of tubes of water-proof material connected each at one end only to said body portion with the pairs of tubes in

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spaced relationship around the peripheral wall of said central rigid buoyant main body portion, with the connected ends of said flexible and inflatable tubes embracing the said transverse median plane, said flexible inflatable tubes in the stowed condition of the life-raft lying collapsed and folded flat in close proximity with the said peripheral wall and in the condition of use of the life-raft being elongated and extending radially from the said central rigid buoyant main portion, rope-like elements extending transversely between the two flexible and inflatable tubes of each pair and connecting said flexible and inflatable tubes in pairs at points spaced along the length of the said tubes to provide a ladder-like structure by which the life-raft may be boarded from the water, retaining means retaining the said flexible and inflatable tubes in the position of close proximity with the said peripheral wall when in the collapsed and folded condition of the tubes and self-contained inflating means mounted in said main rigid and buoyant portion for inflating the flexible inflatable tubes.

References Cited in the file of this patent

UNITED STATES PATENTS

1,133,629	Foster	Mar. 30, 1915
1,220,876	Moore	Mar. 27, 1917
1,238,245	Zaradzki	Aug. 28, 1917
1,505,785	Jiengiel	Aug. 19, 1924
1,810,564	Kelemen	June 16, 1931
2,127,871	Kozloff	Aug. 23, 1938
2,464,086	Hiscock	Mar. 8, 1949
2,482,780	Kirby	Sept. 27, 1949

FOREIGN PATENTS

133,402	Germany	Aug. 14, 1902
537,115	Great Britain	June 10, 1941